



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

DEC 18 2014

Mr. Don Imm  
Field Supervisor  
U.S. Fish and Wildlife Service  
Georgia Ecological Services  
105 Westpark Drive, Suite D  
Athens, Georgia 30606

Dear Mr. Imm:

The U.S. Environmental Protection Agency would like to request that the U.S. Fish and Wildlife Service (FWS) review the enclosed draft Biological Evaluation (BE) for the revisions of Georgia Water Quality Standards Rule 391-3-6-.03, Water Use Classifications and Water Quality Standards. The EPA is submitting this request under the informal consultation provision of 50 CFR section 402.13. As described in the BE, the EPA has made the determination of "No Effect" or "Not Likely to Adversely Affect" regarding the new and revised provisions of Georgia Water Quality Standards. A copy of the referenced rules are available on the Georgia Secretary of State's website at <http://rules.sos.state.ga.us/docs/391/3/6/03.pdf>.

Under the Memorandum of Agreement signed by the FWS and the EPA regarding enhanced coordination under the Clean Water Act and Endangered Species Act, provision V.B.6. provides that the EPA notify the FWS in writing when the EPA makes a determination that a new or revised water quality standard is "not likely to adversely affect" listed species. Additionally, under the terms of the Memorandum of Agreement, the FWS should respond in writing within 30 days of receipt of such a determination, unless extended by mutual agreement. This response should state whether the FWS concurs or does not concur. If the FWS does not concur, it should provide a written explanation that includes the species and/or habitat of concern, the perceived adverse effects, supporting information and a basic rationale.

On page 14 of the BE, we have included a concurrence/signature line for your convenience. If you have questions, please do not hesitate to contact me at (404) 562-9125 or [benante.joanne@epa.gov](mailto:benante.joanne@epa.gov) or Stephen Maurano at (404) 562-9044 or [maurano.stephen@epa.gov](mailto:maurano.stephen@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Joanne Benante", is written over the signature line.

Joanne Benante, Chief  
Water Quality Planning Branch

Enclosure: Biological Evaluation State of Georgia New or Revised Water Quality Standards

cc: Strant T. Colwell - U.S. Fish & Wildlife Service



**Biological Evaluation  
State of Georgia  
New or Revised Water Quality Standards  
December 2014**

**Federal Action:**

The U.S. Environmental Protection Agency review and approval of Georgia's triennial review under Clean Water Act section 303(c)(3):

If the Administrator, within sixty days after the date of submission of the revised or new standard, determines that such standard meets the requirements of this Act, such standard shall thereafter be the water quality standard for the applicable waters of the State.

**Background:**

The Board of Georgia Department of Natural Resources has adopted, and the Environmental Protection Division has submitted, new and revised water quality standards (WQS) to the EPA Region 4. The State has requested that the EPA approve the revisions to the State's Water Quality Standards regulations contained in Rule 391-3-6-.03 *Water Use Classifications and Water Quality Standards*, as adopted on March 23, 2011, and August 27, 2013. In the section "Manner in Which the Action May Affect," specifics for each of the new and/or revised standards changes will be identified and addressed.

This Biological Evaluation (BE) incorporates revisions based on comments from Sandra Tucker, Field Supervisor, Georgia Ecological Services Field Offices, Fish and Wildlife Service (FWS), dated April 2, 2012 and in response to the draft BE transmitted on February 16, 2012, by Fritz Wagener, Water Quality Standards Coordinator, EPA Region 4. Additionally, this BE considers comments from Robin Goodloe, FWS, dated June 6<sup>th</sup>, 2012, and includes revisions from the version sent from Stephen Maurano, EPA, to Strant Colwell, FWS, on March 13, 2013, and discussed with Karen Sughrue, FWS and colleagues, on April 29, 2013, and which was transmitted in draft form to Strant Colwell, FWS, on October 15, 2014.

The revisions to WQS are summarized here:

- Removal of the minimum and maximum hardness bounds from the aquatic life-based water quality criteria equations that apply to all waters of the State for six parameters in subparagraph (e)(ii) of Rule 391-3-6-.03(5);
- Revision of the human health-based water quality criterion for 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD) that applies to all waters of the State in subparagraph (e)(vi) of Rule 391-3-6-.03(5);
- Clarification of subparagraph (c)(iii) of Rule 391-3-6-.03(6) to state that the bacteria criteria for protection of coastal areas where shellfish may be harvested apply to

“shellfish growing areas,” and to update the reference manual for bacteria requirements listed in this Rule;

- Updating designated uses for streams and stream reaches in Rule 391-3-6-.03(14) to assign the Drinking Water use and/or the Recreation use;
- Revisions to Rule 391-3-6-.03(16) to clarify the qualification criteria for waters to be listed as “Waters Generally Supporting Shellfish” in this Rule as well as to state that it may not be legal to harvest shellfish from those waters;
- Revisions of and establishment of new water quality criteria for chlorophyll *a* in subparagraph (a)(i) of Rule 391-3-6-.03(17) for West Point Lake;
- Revisions of certain water quality criteria for chlorophyll *a*, total nitrogen and total phosphorus in subparagraphs (d)(i), (d)(iii) and (d)(viii) of Rule 391-3-6-.03(17) for Lake Allatoona and its Shoal Creek tributary;
- Revisions of certain water quality criteria for chlorophyll *a* in subparagraphs (e)(i) of Rule 391-3-6-.03(17) for Lake Sidney Lanier; and,
- Revisions of certain water quality criteria for chlorophyll *a* and total phosphorus in subparagraphs (f)(i) and (f)(viii) of Rule 391-3-6-.03(17) for Carters Lake and its Mountaintown Creek tributary.

#### **Action Area:**

The action area is all of the waters of the United States within the jurisdiction of the State of Georgia.

#### **Federally Listed Species and Critical Habitats:**

Attachment 1 includes all species in the State and is considered the default listing of federally listed species and critical habitats for “may effect” determinations.

#### **Manner in Which the Action May Affect:**

Each new or revised standard is discussed individually below. If there is a “may affect” determination made for a new or revised standard, each federally listed species or critical habitat that may be affected will be discussed. In those instances, the revision will be reviewed to see the manner in which the action may affect federally listed species. When the effect of a standard is projected to be either a beneficial or insignificant effect then the resulting determination is “not likely to adversely affect.” Adverse effect would lead to a determination of “likely to adversely affect.” Some standards will have “no effect” on federally listed species, if either the species would not be found in water bodies affected by the new or revised standard, or the new/revised standard has no direct relationship to federally listed species. Additionally, because some of the new and/or revised standards adopted by the State are only applicable to water quality criteria

with an endpoint of protection of human health, a determination for those standards is listed as “no discretion.”

New and revised provisions of Georgia WQS are shown in bold text. For each individual change, species or critical habitat affected are listed (if different from the default) and a rationale supporting the determination is provided.

**Revision of subparagraph (e)(vi) of Rule 391-3-6-.03(5) (water quality criterion for 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD) which applies to all waters of the State for protection of human health from consumption of fish)**

**No Discretion** – The EPA has determined that the Agency has “No Discretion” in the approval of the revisions to the water quality criterion for 2,3,7,8 TCDD in Rule 391-3-6-.03(5) under the Endangered Species Act (ESA) section 7 based on the fact that the criterion was established by the State for the protection of human health as an endpoint, i.e., consumption of fish and shellfish. The CWA’s requirements for a particular state water quality criterion relate to the designated use that the criterion is designed to protect. Therefore, the EPA’s review of human health-based criteria is limited to a consideration of whether the criteria protect the designated use associated with human health. The revisions are related to human health and therefore not subject to consultation as outlined in the memo and its attachment from U.S. EPA, Benjamin H. Grumbles, Assistant Administrator, dated January 16, 2009, regarding recommended approaches to improve the ESA consultations on approvals of State & Tribal WQS.

**Revisions to subparagraph (c)(iii) of Rule 391-3-6-.03(6) and Rule 391-3-6-.03(16) relating to shellfish growing waters and waters generally supporting shellfish**

**No Discretion** – The State revised subparagraph (c)(iii) of Rule 391-3-6-.03(6) to clarify that the bacteria criteria for protection of coastal areas where shellfish may be harvested apply to “shellfish growing areas” and to update the reference manual for bacteria requirements listed in the Rule. The State also revised Rule 391-3-6-.03(16) to clarify that the qualification criteria for waters to be listed as “Waters Generally Supporting Shellfish,” and to definitively state that it may not be legal to harvest shellfish from those “Waters Generally Supporting Shellfish.”

Similar to the revision to the water quality criterion for 2,3,7,8 TCDD, the revisions to these two Rules relate to the protection of human health from the consumption of shellfish harvested from State waters. Therefore, the EPA’s review of human health-based criteria is limited to a consideration of whether the criteria protect the designated use associated with human health and the EPA has “No Discretion” in the approval of the revisions under the ESA section 7. The revisions are related to human health and therefore not subject to consultation as outlined in the memo and its attachment from U.S. EPA, Benjamin H. Grumbles, Assistant Administrator, dated January 16, 2009, regarding recommended approaches to improve the ESA consultations on approvals of State & Tribal WQS.

**Revisions to Rule 391-3-6-.03(14) to assign the Drinking Water use and/or the Recreation use to various streams and stream reaches**

**No Discretion** – The EPA has also determined that the Agency has “No Discretion” in the approval of revisions adopted by the State that relate to the assignment of the Drinking Water and Recreation designated uses to various waters of the State, since those State actions only affect the application of water quality criteria that are also based on the protection of human health as an endpoint. The revisions are related to human health and therefore not subject to consultation as outlined in the memo and its attachment from U.S. EPA, Benjamin H. Grumbles, Assistant Administrator, dated January 16, 2009, regarding recommended approaches to improve the ESA consultations on approvals of State & Tribal WQS.

**Revisions to 391-3-6-.03(5)(e)(ii) and (iii) (water quality criteria for protection of aquatic life)**

**Not Likely to Adversely Affect** – The values of water quality criteria for protection of aquatic life were revised for cadmium, chromium III, copper, lead, nickel, and zinc. The State deleted the footnote that applies to the criteria equations that apply to the acute and chronic criteria for these six metals and the new criteria for these pollutants are:

**Freshwater Acute Cadmium Criteria (expressed as the Dissolved Fraction):**

$$(\exp(1.0166[\ln(\text{Hardness})] - 3.924)) (1.136672 - [(\ln \text{Hardness}) (0.041838)]) \mu\text{g/L}$$

**Freshwater Chronic Cadmium Criteria (expressed as the Dissolved Fraction):**

$$(\exp(0.7409[\ln(\text{Hardness})] - 4.719)) (1.101672 - [(\ln \text{Hardness}) (0.041838)]) \mu\text{g/L}$$

**Freshwater Acute Chromium III Criteria (expressed as the Dissolved Fraction):**

$$(\exp(0.8190[\ln(\text{Hardness})] + 3.7256)) (0.316) \mu\text{g/L}$$

**Freshwater Chronic Chromium III Criteria (expressed as the Dissolved Fraction):**

$$(\exp(0.8190[\ln(\text{Hardness})] + 0.6848)) (0.860) \mu\text{g/L}$$

**Freshwater Acute Copper Criteria (expressed as the Dissolved Fraction):**

$$(\exp(0.9422[\ln(\text{Hardness})] - 1.700)) (0.96) \mu\text{g/L}$$

**Freshwater Chronic Copper Criteria (expressed as the Dissolved Fraction):**

$$(\exp(0.8545[\ln(\text{Hardness})] - 1.702)) (0.96) \mu\text{g/L}$$



Freshwater Acute Lead Criteria (expressed as the Dissolved Fraction):

$$(\exp(1.273[\ln(\text{Hardness})] - 1.460)) (1.46203 - [(\ln \text{Hardness}) (0.145712)]) \mu\text{g/L}$$

Freshwater Chronic Lead Criteria (expressed as the Dissolved Fraction):

$$(\exp(1.273[\ln(\text{Hardness})] - 4.705)) (1.46203 - [(\ln \text{Hardness}) (0.145712)]) \mu\text{g/L}$$

Freshwater Acute Nickel Criteria (expressed as the Dissolved Fraction):

$$(\exp([\ln(\text{Hardness})] + 2.255)) (0.998) \mu\text{g/L}$$

Freshwater Chronic Nickel Criteria (expressed as the Dissolved Fraction):

$$(\exp(0.8460[\ln(\text{Hardness})] + 0.0584)) (0.997) \mu\text{g/L}$$

Freshwater Acute Zinc Criteria (expressed as the Dissolved Fraction):

$$(\exp(0.8473[\ln(\text{Hardness})] + 0.884)) (0.978) \mu\text{g/L}$$

Freshwater Chronic Zinc Criteria (expressed as the Dissolved Fraction):

$$(\exp(0.8473[\ln(\text{Hardness})] + 0.0884)) (0.986) \mu\text{g/L}$$

The full footnote, with changes tracked in strikethrough, is presented below:

3. The freshwater aquatic life criteria for these metals are expressed as a function of total hardness (mg/L) in a water body. Values in the table above assume a hardness of 50 mg/L CaCO<sub>3</sub>. For other hardness values, the following equations from the EPA document – National Recommended Water Quality Criteria – EPA 2006 should be used. ~~The minimum hardness allowed for use in these equations shall not be less than 25 mg/L, as calcium carbonate and the maximum shall not be greater than 400 mg/L as calcium carbonate.~~

The following sentence was deleted from the footnote that applies to criteria for these metals: “The minimum hardness allowed for use in these equations shall not be less than 25 mg/L, as calcium carbonate and the maximum shall not be greater than 400 mg/L as calcium carbonate.” The equations for these six parameters are otherwise unchanged from the previous standards and identical to the EPA’s Clean Water Act (CWA) section 304(a) recommended criteria,<sup>1</sup> and the EPA’s published compilation of national recommended water quality criteria in a summary table.<sup>2</sup> The EPA’s recommended criteria guidance for these six parameters does not include either a minimum or maximum hardness cutoff. These revisions do not directly modify the

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<sup>1</sup> See EPA’s *National Recommended Water Quality Criteria*, 2005, found at <http://water.epa.gov/scitech/swguidance/standards/current/index.cfm>

<sup>2</sup> See <http://www.epa.gov/waterscience/criteria/wqctable/>

criteria equation, but remove the constraint in the footnote on the range of hardness values. The revised criteria therefore, will be calculated without these constraints, to be protective of aquatic life and account for site-specific water chemistry across all ranges. This will allow greater accuracy in the application of the criteria, and therefore, this revision is determined to be not likely to adversely affect.

**Revisions to paragraphs (a), (d), (e) and (f) of 391-3-6-.03(17) (nutrient water quality criteria for certain lakes)**

**Not Likely to Adversely Affect** – The State rule provides water quality criteria for West Point Lake in Paragraph (a) of Rule 391-3-6-.03(17), for Lake Allatoona in Paragraph (d), for Lake Sidney Lanier in Paragraph (e) and for Carters Lake in Paragraph (f). The State adopted the following revisions, which are shown in underline (new provisions) and strikethrough (deleted provisions):

- (a) West Point Lake: Those waters impounded by West Point Dam and downstream of U.S. 27 at Franklin.
- (i) Chlorophyll a: For the months of April through October, the average of monthly photic zone composite samples shall not exceed ~~27 µg/L at the LaGrange Water intake~~ the chlorophyll a concentrations at the locations listed below more than once in a five-year period.
  - 1. Upstream from the Dam in the Forebay 22 µg/L
  - 2. LaGrange Water Intake 24 µg/L
- (d) Lake Allatoona: Those waters impounded by Allatoona Dam and upstream to State Highway 5 on the Etowah River, State Highway 5 on Little River, the Lake Acworth Dam and the confluence of Little Allatoona Creek and Allatoona Creek. Other impounded tributaries to an elevation of 840 feet mean sea level corresponding to the normal pool elevation of Lake Allatoona.
- (i) Chlorophyll a: For the months of April through October, the average of monthly mid-channel photic zone composite samples shall not exceed the chlorophyll a concentrations at the locations listed below more than once in a five-year period:
  - 1. Upstream from the Dam in the Dam 10 µg/L
  - 2. Allatoona Creek upstream from I-75 ~~10~~ 12 µg/L
  - 3. Mid-Lake downstream from Kellogg Creek 10 µg/L
  - 4. Little River upstream from Highway 205 15 µg/L
  - 5. Etowah River upstream from Sweetwater Creek ~~12~~ 14 µg/L
- (iii) Total Nitrogen: Not to exceed a growing season average of 4 mg/L as nitrogen in the photic zone.



(viii) Major Lake Tributaries: For the following major tributaries, the annual total phosphorous loading to Lake Allatoona shall not exceed the following:

1. Etowah River at State Highway 5 spur and 140, at the USGS gage	340,000 lbs/yr
2. Little River at State Highway 5 (Highway 754)	42,000 lbs/yr
3. Noonday Creek at North Rope Mill Road	38,000 lbs/yr
4. Shoal Creek at State Highway 108 (Fincher Road)	<del>9,200</del> <u>12,500</u> lbs/yr

(e) Lake Sidney Lanier: Those waters impounded by Buford Dam and upstream to Belton Bridge Road on the Chattahoochee River, 0.6 miles downstream from State Road 400 on the Chestatee River, as well as other impounded tributaries to an elevation of 1070 feet mean sea level corresponding to the normal pool elevation of Lake Sidney Lanier.

(i) Chlorophyll a: For the months of April through October, the average of monthly mid channel photic zone composite samples shall not exceed the chlorophyll a concentrations at the locations listed below more than once in a five-year period:

1. Upstream from the Buford Dam forebay	5 µg/L
2. Upstream from the Flowery Branch confluence	<del>5</del> <u>6</u> µg/L
3. At Browns Bridge Road (State Road 369)	<del>5</del> <u>7</u> µg/L
4. At Bolling Bridge (State Road 53) on Chestatee River	10 µg/L
5. At Lanier Bridge (State Road 53) on Chattahoochee River	10 µg/L

(f) Carters Lake: Those waters impounded by Carters Dam and upstream on the Coosawattee River as well as other impounded tributaries to an elevation of 1072 feet mean sea level corresponding to the normal pool elevation of Carters Lake.

(i) Chlorophyll a: For the months of April through October, the average of monthly midchannel photic zone composite samples shall not exceed the chlorophyll a concentrations at the locations listed below more than once in a five-year period:

1. Carters Lake upstream from Woodring Branch	<del>5</del> <u>10</u> µg/L
2. Carters Lake at Coosawattee River embayment mouth	10 µg/L

(viii) Major Lake Tributaries: For the following major tributaries, the annual total phosphorous loading at the compliance monitoring location shall not exceed the following:

1. Coosawattee River at Old Highway 5	151,500 pounds
2. Mountaintown Creek at U.S. Highway 76	<del>8,000</del> <u>16,000</u> pounds

The 1990 "Georgia Lake Law" (O.C.G.A 12-5-23.1) requires WQS to be set for publicly owned lakes or reservoirs of more than 1,000 acres (including West Point Lake, Lake Allatoona, Lake Sidney Lanier and Carters Lake) for, among other parameters, chlorophyll *a* (chl *a*), total nitrogen (TN) and total phosphorus (TP). These criteria must maintain and protect the lakes'

designated uses: Recreation and Drinking Water (and implicitly, the Fishing use), in accordance with 391-3-6-.03-(2)(b)(i) and 391-3-6-.03(14). The initial criteria were developed using a limited set of data gathered during Diagnostic and Feasibility Studies for the respective lakes and adopted for West Point Lake in 1995, Lake Allatoona and Lake Lanier in 1999, and Carters Lake in 2002. Prior to the 2010-2011 triennial review, Georgia most recently amended the chl *a* criteria for lakes and reservoirs during its 2007-2008 triennial review of WQS. Previously, the criteria had been expressed as: “the average of monthly mid-channel photic zone composite samples shall not exceed [the criterion magnitude].” The 2007-2008 revisions added a criteria exceedance frequency of, “[not] more than once in a five-year period” and seasonal applicability, “[f]or the months of April through October [i.e. growing season].” In its review, the EPA noted that “[a]mbient chlorophyll *a* levels depend on a number of factors” and “[t]he initial adoption of chlorophyll *a* criteria for these reservoirs was based on a limited amount of data.” Furthermore, the EPA stated, “[t]he data collected subsequent to the initial adoption of these criteria allowed the State to conduct an evaluation of use attainment for the fisheries use, the drinking water use... and the recreational use for each reservoir, in relation to the allowable frequency of exceedance of the value of each criterion and its duration, i.e., the growing season average.” In its approval, the EPA determined that, “[t]he rationale used by the State in the decision to revise the chlorophyll *a* criteria is based on a reasonable interpretation of the data and ... the revisions to the chlorophyll *a* criteria are scientifically defensible.”

As the impetus of these standards revisions, Georgia Environmental Protection Division was asked to reevaluate the criteria for West Point Lake, as chl *a* levels had declined since the early 2000's. EPD also chose to reevaluate criteria for Lake Allatoona, Lake Lanier, and Carters Lake, in preparation for development of total maximum daily loads (TMDLs). For each reservoir, linked watershed, hydrodynamic and water quality models were built to support the derivation of the new criteria. These models were calibrated and temporally extended with a substantial amount of additional data, in order to be more predictive of water quality conditions in each reservoir. These models and new information were then used by EPD to reevaluate the water quality criteria for nutrients that apply to the reservoirs.

The State has evaluated available data and concluded that the criteria revisions are sufficient to protect and maintain aquatic life uses and fishery resources within West Point Lake, Lake Allatoona, Lake Sidney Lanier and Carters Lake. Please reference Attachment 2 for a Spatial Coverage of Reservoirs with Nutrient Criteria Revisions. The criteria are intended to encompass the lacustrine portions of the referenced waterbodies (i.e. the impounded main body of the reservoir and tributaries to normal pool elevation). The criteria include both casual parameters (TN and TP) expressed either as concentrations or loadings in the reservoir (with corresponding phosphorus loadings from tributaries), as well as a response parameter (chl *a*) at representative compliance points in the reservoir. Loadings from the tributaries are calculated to be protective of endpoints in the reservoir – in effect they serve as downstream protection values for the lentic receiving water, but not necessarily as instream protection values for the lotic tributary. To derive nutrient criteria for the protection of these tributaries (and other flowing waters statewide), Georgia is currently investigating potentially responsive endpoints (periphyton, macroinvertebrates and fish communities). These criteria will be adopted in a future action, as described in “Georgia’s Plan for the Adoption of WQS for Nutrients.”

Implementation of these criteria will avoid excessive concentrations of nutrients in the respective reservoirs, which can lead to algal bloom conditions and invasive aquatic plants and subsequently, can result in adverse effects on the aquatic life community and resource of a water body. More precise criteria, derived to be protective against excessive anthropogenic eutrophication, are expected to be beneficial to indigenous aquatic fauna which evolved in natural trophic conditions.

The EPA does note the presence of several listed species in the vicinity of the reservoirs under consideration, including 5 fish species and 10 mussel species that are federally listed as threatened or endangered. Additionally, although quantitative information regarding nutrient impacts on these species is generally unavailable, some information indicates the potential detrimental impact of nutrients enrichment on these taxa. Specifically, the International Union for Conservation of Nature (IUCN) includes anthropogenic impacts, with potential nutrient inputs, in the list of major threats to *Percina antesella*:

“Amber Darters are vulnerable to loss of quality habitat resulting from suburban and urban development in the Etowah watershed and parts of the Conasauga watershed, where the human population is rapidly increasing. In the upper Conasauga system, non-point source pollution from agricultural lands may be significant. Stream degradation results in runoff from forestry and agricultural areas, residential and commercial development and road construction, and from increased stormwater runoff from impervious areas.”<sup>3</sup>

More precisely, the FWS Environmental Conservation Online System (ECOS) states that threats to *Percina aurolineata* include impacts associated with nutrients, such as:

“...sewage pollution ...loss of habitat from reservoir construction and degradation of water quality, as well as the effects of habitat fragmentation... Losses of vascular plants and an increase in blue-green algae... Inorganic nitrogen and phosphorus, from discharges, accumulate in the basin and can lead to algal blooms...”<sup>4</sup>

Although these impacts to *P. aurolineata* are in reference to the downstream Cahaba River Basin, it is reasonable to consider that there could be similar concerns for other species found in adjacent drainages, including the congeneric *P. antesella*, the confamilial *Etheostoma scotti* and *Etheostoma etowahae*, and species that share notable life history traits such as *Cyprinella caerulea*. However, the nutrient loadings associated with this action are not delivered to the habitat of these species – which are located either in tributaries upstream of the affected impoundment or tributaries that flow into rivers downstream of the impoundment (e.g. the Etowah, Chattahoochee and Coosawattee Rivers). Likewise, the respective life histories of these species indicate that none are likely to be present in the lentic waters of the impoundment. The relevant species do not tolerate impoundment conditions well and would not be found within waters associated with this action. Additional details are provided in Table 1 of Attachment 3: “Habitat & Distribution of Listed Aquatic Species in the Vicinity of Reservoirs Undergoing

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<sup>3</sup> <http://www.iucnredlist.org/details/16585/0>

<sup>4</sup> Goldline Darter, *Percina aurolineata*, Species Code E05S V01, [http://ecos.fws.gov/docs/life\\_histories/E05S.html](http://ecos.fws.gov/docs/life_histories/E05S.html)



Nutrient Criteria Revisions,” and discussed in reference to the specific waterbodies below.

Additionally, several species of flowering plants and ferns are in the vicinity of the pertinent reservoirs, but do not occur in the aquatic reservoir habitats affected by the criteria, including *Sarracenia oreophila* (Endangered Green Pitcher-Plant), *Scutellaria montana*, (Endangered Large-Flowered Skullcap), *Isotria medeoloides* (Threatened Small Whorled Pogonia), *Xyris tennesseensis* (Endangered Tennessee Yellow-Eyed Grass), *Amphianthus pusillus* (Threatened Pool Sprite, Little Amphianthus), and *Isoetes melanospora* (Endangered Black Spored Quillwort). Due to their mobility and dependence on aquatic resources, further consideration is also required for two mammals *Myotis grisescens* (Endangered Gray Bat) and *Myotis sodalis* (Endangered Indian Bat), as well as one bird *Mycteria Americana* (Threatened Wood Stork), which are found in the vicinity of the pertinent reservoirs. The proposed criteria should protect the biological health of the system, prevent low dissolved oxygen occurrences, and excessive algal growth. This should, in turn, protect and improve the insect and fish foraging base for these aquatic dependent species. Additional details are provided in Table 2 of Attachment 3: “Life History of Aquatic Dependent Species in the Vicinity of Reservoirs Undergoing Nutrient Criteria Revisions.”

#### West Point Lake:

Derivation of the new criteria is described in the report, “West Point Lake Model Scenarios Description and Results for Nutrient Criteria Revisions, Georgia Environmental Protection Division, May 2013.” The report notes that, since the adoption of the criteria in 1995, there has been a general downward trend in chl *a* levels at the City of LaGrange water intake. Additionally, adequate monitoring data has been collected at a station upstream from the dam in the forebay to support the establishment of a new compliance point. Reservoir water quality model results indicated that the initial 27 µg/L standard at the water intake could be lowered to 24 µg/L to account for this reduction in trophic state, and a corresponding 22 µg/L criterion could be established upstream from the dam in the forebay. These chl *a* values were determined, by means of the reservoir water quality model, to be protective of the existing dissolved oxygen criteria. The criteria are protective of the Fishing Use, as the higher existing criteria have not resulted in fish kills from dissolved oxygen deficiency, and the lower trophic status achieved by the new criteria is expected to be beneficial to the native Gulf Race Striped Bass fishery in the lake. The EPA has determined that these revisions to Rule 391-3-6-.03(17)(a) are not likely to adversely affect listed species, as the establishment and increasing stringency of the criteria will protect against nutrient over-enrichment.

#### Lake Allatoona:

Derivation of the new criteria is described in the report, “Lake Allatoona Model Scenarios Description and Results for Nutrient Criteria Revisions, Georgia Environmental Protection Division, September 2010.” The State’s water quality model of Lake Allatoona predicts that even after all urban, agricultural and point source nutrient loadings are controlled, the reservoir’s chl *a* standard will still be exceeded at two compliance points: Allatoona Creek and the Etowah River. In responding to a comment regarding the proposal to revise the chl *a* criteria for the Allatoona Creek arm, EPD stated:

Since the standards were adopted, more data has been collected and EPD has determined that natural chlorophyll *a* concentrations in the Lake are far more complex than previously realized. In addition, EPD has developed refined watershed and lake models that have been used to reevaluate the Lake standards. The revision of the chlorophyll *a* standard in the Allatoona Creek arm is necessary since the natural model scenario, all forested, indicates chlorophyll levels above the current standard of 10 ug/L ...

The EPA has reviewed the models for Lake Allatoona which were developed and refined by EPD and agrees that the current modeling results are scientifically defensible and sufficient to support the revisions to the chl *a* criteria for the Allatoona Creek and Etowah River arms of the lake. The revisions reflect the need to refine these criteria since the previously adopted criteria appear to be set above natural, all forested conditions in the two watersheds, and thus unattainable. Historical data for the lake indicate that the designated uses of the lake have been maintained during periods when the chl *a* levels at these two locations were at or below the revised criteria concentrations. Therefore, designated uses of the lake are expected to be protected if chl *a* levels are maintained at the revised criteria levels in the future.

The total nitrogen criterion for Lake Allatoona was also revised, to reflect that the duration of the criteria is the average of total nitrogen concentrations over the growing season. Based on review of the State's analysis, the EPA agrees that the modeling projections for possible effects of revising the expression of the total nitrogen criterion are scientifically defensible, the criteria duration (growing season) is ecologically relevant, and that the revised criteria are sufficient to protect the designated uses of Lake Allatoona as well as the WQS of downstream waters.

Additionally, the total phosphorus criteria for Shoal Creek at State Highway 108 was revised from an annual loading of 9,200 pounds per year to 12,500 pounds per year. EPD's water quality modeling predicts that the annual loading of total phosphorus for Shoal Creek at State Highway 108 under the "all forested" scenario is approximately 8,000 pounds per year. However, in wet years, the calculated annual load under the "all forested" scenario is often higher than the modeled loading at that location. Therefore, EPD revised the phosphorus criterion that applies at that location to 12,500 pounds per year, which is an approximation of water quality conditions that are similar to "all forested" conditions. EPD estimates that the land use in the Shoal Creek basin is 83% forested, with no point sources, and 15% of the watershed is used for agricultural purposes. Also, the model predicts that all downstream chl *a* criteria will still be achieved with the relatively small increased phosphorus loading associated with the revised criteria loading value for Shoal Creek. Based on review of EPD's analysis of data and the modeling completed for the Shoal Creek basin and the Lake Allatoona watershed, the EPA agrees that the modeling projections for possible effects of revising the total phosphorus loading criteria for Shoal Creek are scientifically defensible, and that revised criteria are sufficient to protect the designated uses of Lake Allatoona downstream of Shoal Creek at State Highway 108.

Fine resolution mapping of listed species distributions is available for Lake Allatoona from the Etowah Habitat Conservation Plan and is provided in Attachment 2: "Spatial Coverage Of Reservoirs with Nutrient Criteria Revisions," Figures 4-8.<sup>5</sup> The life history of *P. antsellia*

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<sup>5</sup> Etowah Habitat Conservation Plan, Maps, <http://www.etowahhcop.org/background/maps.htm>

indicates that it, “[o]ccurs in swift gravel and sand riffles and runs of medium-sized river.”<sup>6</sup> and “...inhabit[s] shallow riffles with moderate to swiftly flowing water, usually with shifting gravel and patches of riverweed,”<sup>7</sup> *E. etowahae*, “...is found in small to medium-sized streams with cobble and gravel riffles and moderate to swift current,”<sup>8</sup> and is “...confined to small rapids and riffles,”<sup>9</sup> and *E. scotti*, “...inhabits small to medium-sized creeks with moderate gradient and rocky substrates,”<sup>10</sup> and “...prefers small streams—some only a few feet wide... Within these streams it can be found in shallow pools and runs over gravel and large rocks.”<sup>11</sup> Both *Etheostoma* genera are also found in tributaries downstream to the Etowah River, but not in the mainstem where nutrient loadings would be delivered from Lake Allatoona. The threatened Goldline darter, *P. aurolineata*, is present, but only in the adjacent Coosawattee River system.<sup>12</sup> It is understood that listed mussel species in surrounding areas, *L. altilis*, *M. penicillatus*, *P. decisum*, and *P. greenii*, do not tolerate impoundment conditions well and would not be found within the waters associated with this action.<sup>13</sup>

The EPA has determined that these revisions to Rule 391-3-6-.03(17)(d) are not likely to adversely affect listed species, since none occur in Lake Allatoona or in the Etowah River mainstem downstream of Lake Allatoona.

#### Lake Sidney Lanier:

Derivation of the new criteria is described in the report, “Lake Lanier Model Scenarios Description and Results for Nutrient Criteria Revisions, Georgia Environmental Protection Division, May 2013.” Growing season chl *a* levels in Lake Lanier were modelled in a scenario where all land use in the watershed was forested and results indicated a natural trophic gradient from the upstream, riverine portions of the reservoir, transitioning downstream to the deeper, lacustrine portions nearer the dam. The criteria were normalized to account for this gradient, to reflect the expected higher values upstream at Lanier Bridge (10 µg/L) and Boiling Bridge (10 µg/L), progressing downstream to Browns Bridge (7 µg/L), Flowery Branch (6 µg/L), and the Dam Forebay (5 µg/L). This approach more closely reflects the expected gradient of productivity in the reservoir in the absence of anthropogenic landuses. In their response to comments, EPD notes that this criteria derivation approach was chosen, “...to account for the fact [that] these stations are transitional zones between the upper portions of the lake that are more riverine and

<sup>6</sup> Page, L.M. and B.M. Burr, 1991. A field guide to freshwater fishes of North America north of Mexico. Houghton Mifflin Company, Boston. 432 p. via FishBase.org <http://www.fishbase.org/summary/Percina-antesella.html>

<sup>7</sup> <http://www.etowahhcop.org/background/documents/antesella.pdf>

<sup>8</sup> Fishes of Alabama and the Mobile Basin pg 626 and 59 FR 65512, 12/20/94, via USEPA Region 4 Request for Concurrence on the State of Georgia Draft Specific Criteria for Lakes and Major Lake Tributaries: Lake Allatoona and Lake Lanier. 02/23/2000.

<sup>9</sup> <http://www.etowahhcop.org/background/documents/etowahae.pdf>

<sup>10</sup> Fishes of Alabama and the Mobile Basin pg 665 and 59 FR 65512, 12/20/94, via USEPA Region 4 Request for Concurrence on the State of Georgia Draft Specific Criteria for Lakes and Major Lake Tributaries: Lake Allatoona and Lake Lanier. 02/23/2000.

<sup>11</sup> <http://www.etowahhcop.org/background/documents/scotti.pdf>

<sup>12</sup> [http://ecos.fws.gov/docs/life\\_histories/E05S.html](http://ecos.fws.gov/docs/life_histories/E05S.html)

<sup>13</sup> Red Book: Endangered and Threatened Species of the Southeast United States, The Official World Wildlife Fund Guide to Endangered Species of North America, pgs. 2138, 2152, 2159, 2165, 2167, and 52 FR 11169, 4/7/87, 58 FR 14339, 3/17/93 via USEPA Region 4 Request for Concurrence on the State of Georgia Draft Specific Criteria for Lakes and Major Lake Tributaries: Lake Allatoona and Lake Lanier. 02/23/2000.



the deeper portions of the lake at the Dam Pool.” The new criteria were determined, by means of the reservoir water quality modelling, to be protective of the existing dissolved oxygen standard. EPD also states that the criteria are protective of the Fishing and Recreation Uses, as there have not been fish kills from dissolved oxygen deficiency since the nutrient standards were adopted, nor recreational closures due to algal blooms.

The EPA has determined that these revisions to Rule 391-3-6-.03(17)(e) are not likely to adversely affect listed species, since none occur in Lake Sidney Lanier or within several hundred miles on the Chattahoochee River mainstem downstream of Lake Sidney Lanier.

#### Carters Lake:

Derivation of the new criteria is described in the report, “Carters Lake Model Scenarios Description and Results for Nutrient Criteria Revisions, Georgia Environmental Protection Division, May 2013.” Modeling of water quality in Carters Lake indicated that even under all forested land use, the chl *a* at Carters Lake upstream from Woodring Branch and the total phosphorus loads for Mountaintown Creek at U.S. Highway 76 were anticipated to exceed the criteria, indicating they needed to be revised. EPD’s response to comment states that, “The criteria are being raised because modeling results of an all forested watershed show that the current criterion is unattainable.” Specifically, the report states that, “Increasing the annual Total Phosphorus load at Mountaintown Creek to 16,000 lb/year is necessary because in wet years the criteria is currently un-obtainable [*sic*] given the current landuse, and also under an all forested scenario.” Likewise, regarding the chl *a* criteria, the report states, “The results of the all forest model scenario also indicate that the Woodring Branch site can still exceed the current chlorophyll *a* criteria... further demonstrating that this compliance station needs to be adjusted.” The new criteria were determined, by means of the reservoir water quality modelling, to be protective of the existing dissolved oxygen standard. Water quality modelling was used to ensure that the new total phosphorus standard would be protective of the new chl *a* standard, as described in the report, “This new standard will be protective of the growing season average chlorophyll *a* concentration for each assessment site in the lake...” Furthermore, the criteria are expected to be protective of the Fishing, Recreation and Drinking Water Uses, as there have not been fish kills from dissolved oxygen deficiency since the nutrient standards were adopted, nor recreational closures due to algal blooms at Army Corps of Engineer operate beaches. It is notable that a single *P. antesella* specimen was collected downstream of Carters Lake, and *P. aurolineata* was detected, “at 7 sites located in the Cartecay River, Ellijay River, Mountaintown Creek and the Coosawattee River upstream of Carters Lake.”<sup>14</sup> However it “...prefers moderate to swift currents and water depths greater than 2 feet. It is found over sand or gravel substrata interspersed among cobble and small boulders.”<sup>15</sup>

The EPA has determined that these revisions to Rule 391-3-6-.03(17)(f) are not likely to adversely affect listed species, since none occur in Carters Lake. Unless available information indicates that the single specimen is indicative of resident population or habitat, it appears unlikely that the species occur in the Coosawattee River mainstem downstream of Carters Lake.

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<sup>14</sup>[http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/fishes/percina\\_aurolineata.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/fishes/percina_aurolineata.pdf)

<sup>15</sup> [http://ecos.fws.gov/docs/life\\_histories/E05S.html](http://ecos.fws.gov/docs/life_histories/E05S.html)

## **Summary of the EPA's Determination:**

### **No Discretion**

Revision of subparagraph (e)(vi) of Rule 391-3-6-.03(5) – revision of the water quality criterion for 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD) that applies to all waters of the State

Revision of subparagraph (c)(iii) of Rule 391-3-6-.03(6) – clarification of protections for shellfish growing areas

Revision of Rule 391-3-6-.03(14) – addition of the Drinking Water use and/or the Recreation use for various streams and stream reaches

Revisions to Rule 391-3-6-.03(16) – clarification of the qualification criteria for waters generally supporting shellfish

### **Not Likely to Adversely Affect**

Revisions to 391-3-6-.03(5)(e)(ii) and (iii) – revision of acute and chronic water quality criteria for protection of aquatic life for cadmium, chromium III, copper, lead, nickel, and zinc.

Revisions to 391-3-6-.03(17) – revision of water quality criteria for West Point Lake, Lake Allatoona, Lake Sidney Lanier, and Carters Lake.



Joanne Benante  
Chief, Water Quality Planning Branch  
Environmental Protection Agency

12/18/14  
Date

File # \_\_\_\_\_

Circle One:    Concur    Non-Concur    Concur with Suggestions (Attached)

\_\_\_\_\_  
U.S. Fish and Wildlife Service

\_\_\_\_\_  
Date

## ATTACHMENT 1

### THREATENED AND ENDANGERED SPECIES IN GEORGIA

<u>Species</u>	<u>Listing Name</u>	<u>Status</u>
Blue shiner	<i>Cyprinella caerulea</i>	Threatened
Cherokee darter	<i>Etheostoma scotti</i>	Threatened
Goldline darter	<i>Percina aurolineata</i>	Threatened
Snail darter	<i>Percina tanasi</i>	Threatened
Etowah darter	<i>Etheostoma etowahae</i>	Endangered
Amber darter	<i>Percina antesella</i>	Endangered
Conasauga logperch	<i>Percina jenkinsi</i>	Endangered
Purple bankclimber	<i>Elliptoideus sloatianus</i>	Threatened
Fine-lined pocketbook	<i>Hamiota altilis</i>	Threatened
Alabama moccasinshell	<i>Medionidus acutissimus</i>	Threatened
Fat three-ridge	<i>Amblema neislerii</i>	Endangered
Upland combshell	<i>Epioblasma metastriata</i>	Endangered
Southern acornshell	<i>Epioblasma othcaloogensis</i>	Endangered
Shiny-rayed pocketbook	<i>Hamiota subangulata</i>	Endangered
Coosa moccasinshell	<i>Medionidus parvulus</i>	Endangered
Gulf moccasinshell	<i>Medionidus penicillatus</i>	Endangered
Ochlockonee moccasinshell	<i>Medionidus simpsonianus</i>	Endangered
Southern clubshell	<i>Pleurobema decisum</i>	Endangered
Southern pigtoe	<i>Pleurobema georgianum</i>	Endangered
Oval pigtoe	<i>Pleurobema pyriforme</i>	Endangered

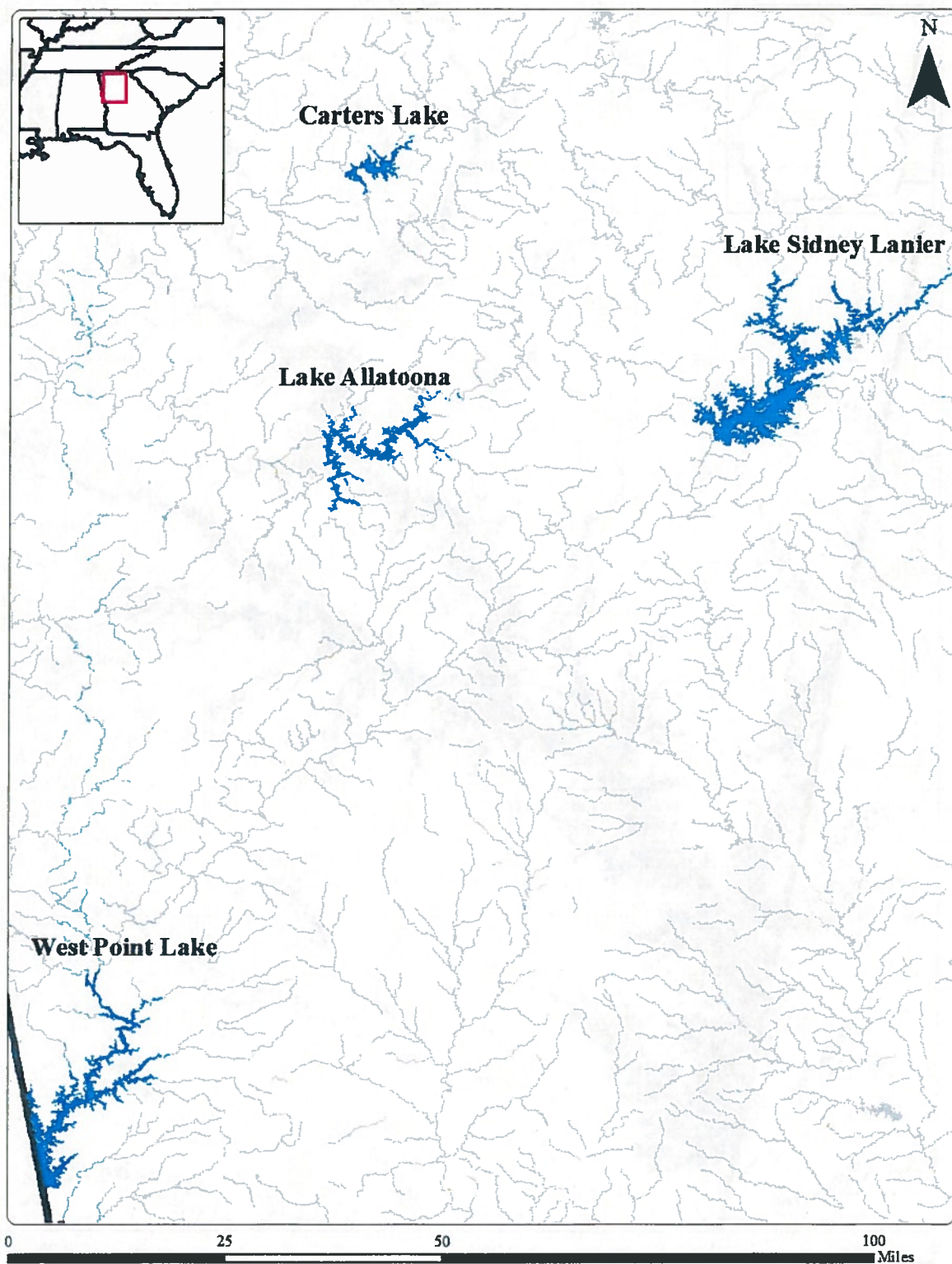
<u>Species</u>	<u>Listing Name</u>	<u>Status</u>
Triangular kidneyshell	<i>Ptychobranhus greeni</i>	Endangered
Pool Sprite, Little Amphianthus	<i>Amphianthus pusillus</i>	Threatened
Swamp pink	<i>Helonias bullata</i>	Threatened
Mohr's Barbara's-buttons	<i>Marshallia mohrii</i>	Threatened
Kral's water-plantain	<i>Sagittaria secundifolia</i>	Threatened
Virginia spiraea	<i>Spiraea virginiana</i>	Threatened
Black-spored quillwort	<i>Isoetes melanospora</i>	Endangered
Mat-forming quillwort	<i>Isoetes tegetiformans</i>	Endangered
Pondberry	<i>Lindera melissifolia</i>	Endangered
Canby's dropwort	<i>Oxypolis canbyi</i>	Endangered
Harperella	<i>Ptilimnium nodosum</i>	Endangered
Green pitcher plant	<i>Sarracenia oreophila</i>	Endangered
American Chaff-seed	<i>Schwalbea Americana</i>	Endangered
Fringed campion	<i>Silene polypetala</i>	Endangered
Cooley's meadowrue	<i>Thalictrum cooleyi</i>	Endangered
Relict trillium	<i>Trillium reliquum</i>	Endangered
Tennessee yellow-eyed grass	<i>Xyris tennesseensis</i>	Endangered
Loggerhead sea turtle	<i>Caretta caretta</i>	Threatened
Green sea turtle	<i>Chelonia mydas</i>	Threatened
Frosted Flatwoods salamander	<i>Ambystoma cingulatum</i>	Threatened
Eastern indigo snake	<i>Drymarchon corais couperi</i>	Threatened
Reticulated Flatwoods salamander	<i>Ambystoma bishopi</i>	Endangered

<b><u>Species</u></b>	<b><u>Listing Name</u></b>	<b><u>Status</u></b>
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered
Hawksbill sea turtle	<i>Eretmochelys imbricate</i>	Endangered
Kemp's ridley sea turtle	<i>Lepidochelys kempi</i>	Endangered
Piping plover	<i>Charadrius elodus</i>	Threatened
Kirtland's warbler	<i>Dendroica kirtlandii</i>	Endangered
Wood stork	<i>Mycteria Americana</i>	Endangered
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
Gray Bat	<i>Myotis grisescens</i>	Endangered
Indiana Bat	<i>Myotis sodalist</i>	Endangered
West Indian Manatee	<i>Trichechus manatus</i>	Endangered

## **ATTACHMENT 2**

### **SPATIAL COVERAGE OF RESERVOIRS WITH NUTRIENT CRITERIA REVISIONS**





**Figure 1. Distribution of reservoirs in Georgia with nutrient criteria revisions analyzed in this biological evaluation.**

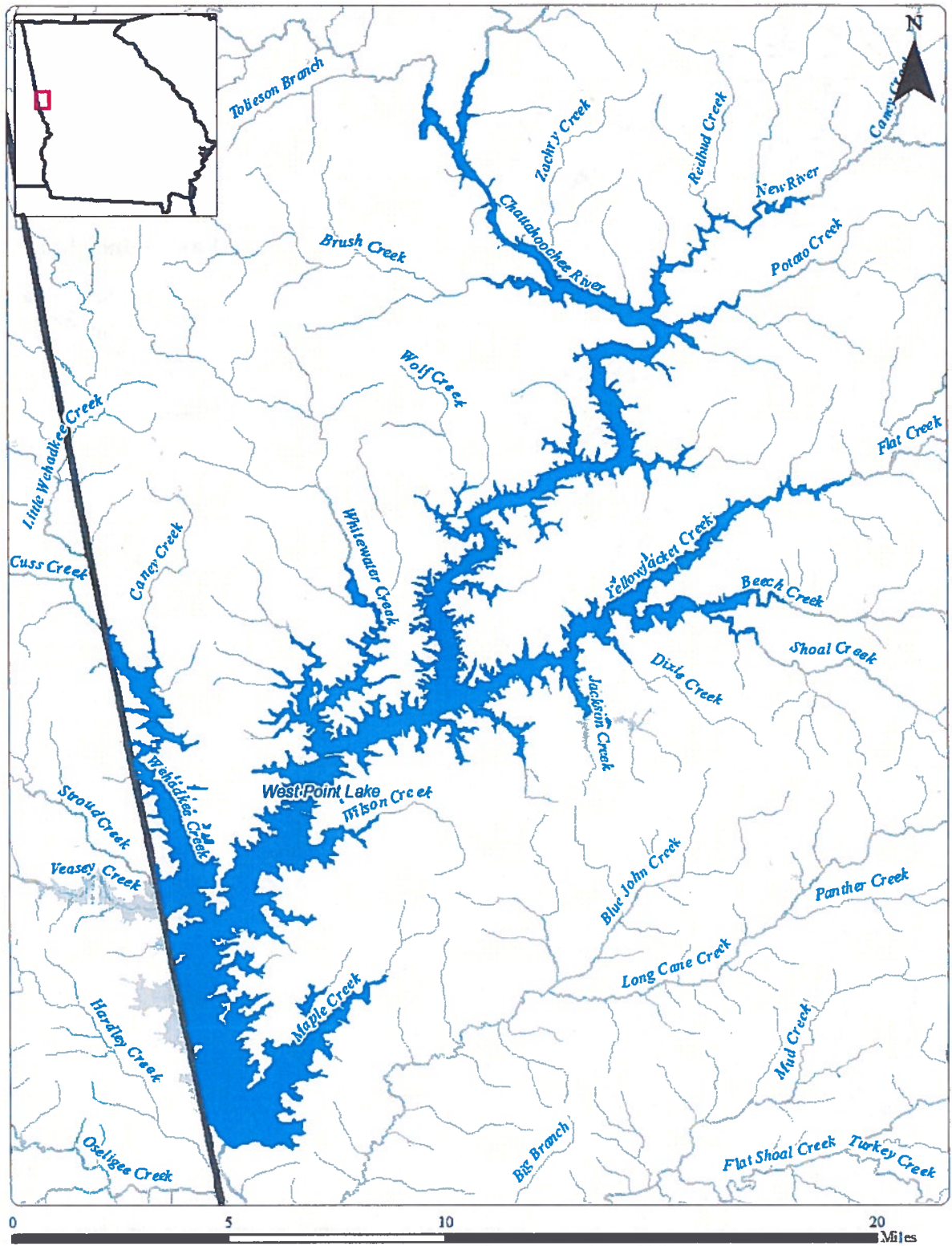


Figure 2. Map of West Point Lake

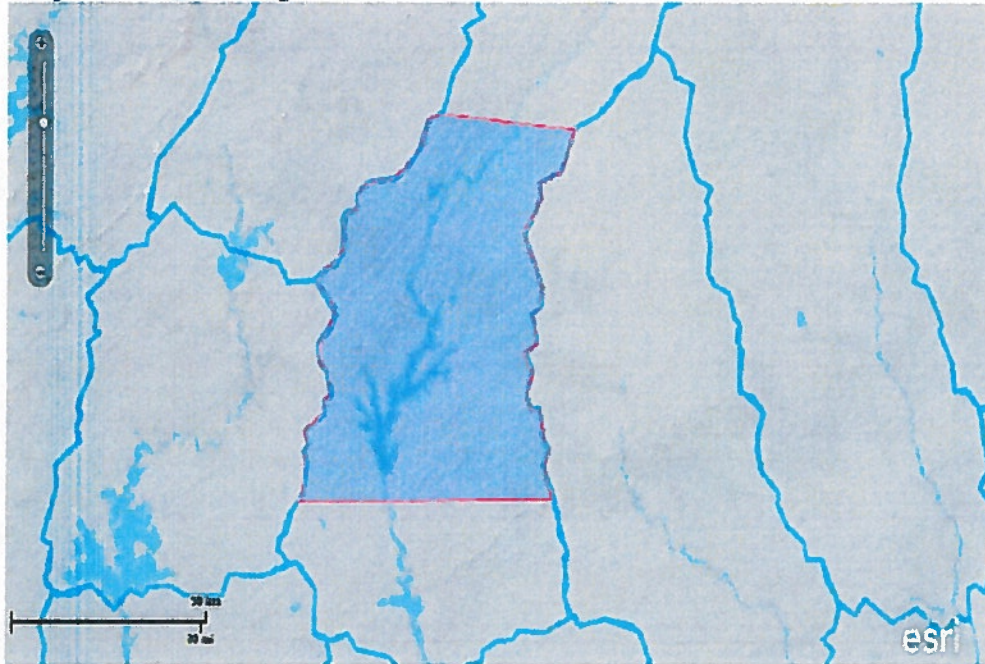




U.S. Fish and Wildlife Service

## Natural Resources of Concern

### *Project Location Map:*



### *Project Counties:*

Chambers, AL | Randolph, AL | Carroll, GA | Coweta, GA | Fulton, GA | Harris, GA | Heard, GA |  
Meriwether, GA | Troup, GA

**Figure 3. Spatial Query for Listed Aquatic Species in the Vicinity of West Point Lake**  
Source: IPaC - Information, Planning, and Conservation System at: <http://ecos.fws.gov/ipac/>  
Accessed: March 7, 2013.

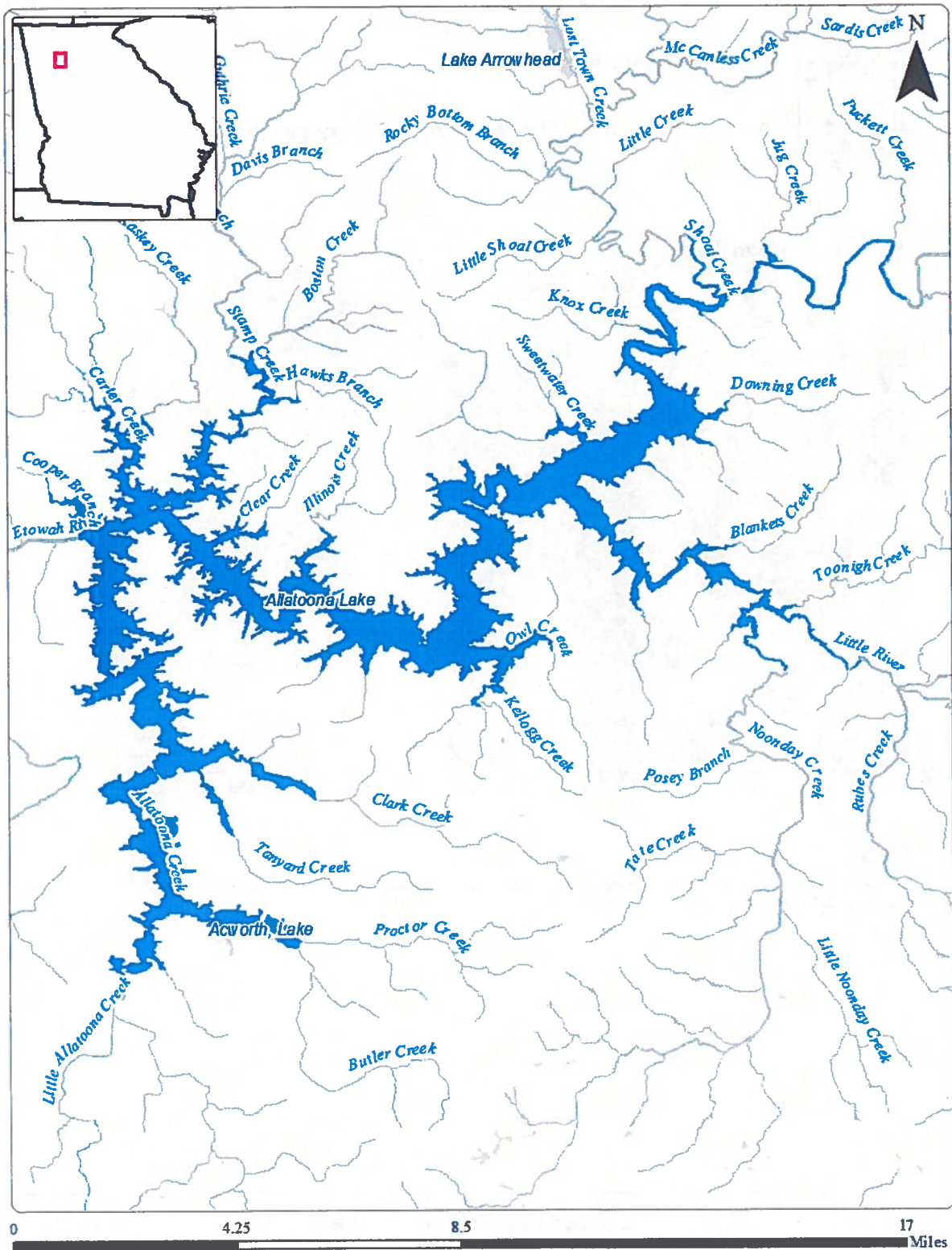


Figure 4. Map of Lake Allatoona

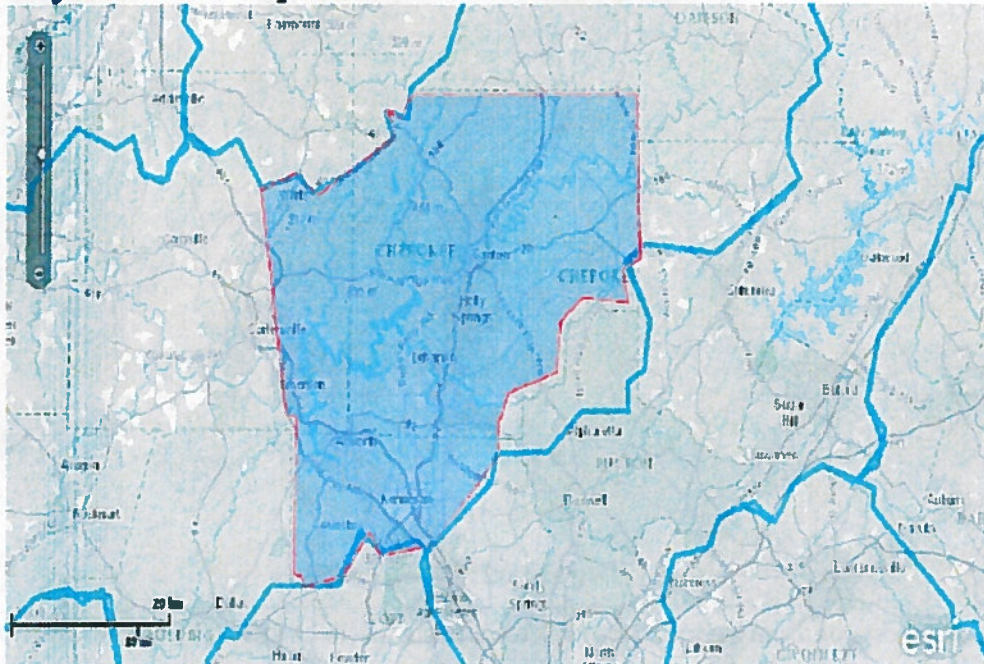




U.S. Fish and Wildlife Service

## Natural Resources of Concern

### *Project Location Map:*



### *Project Counties:*

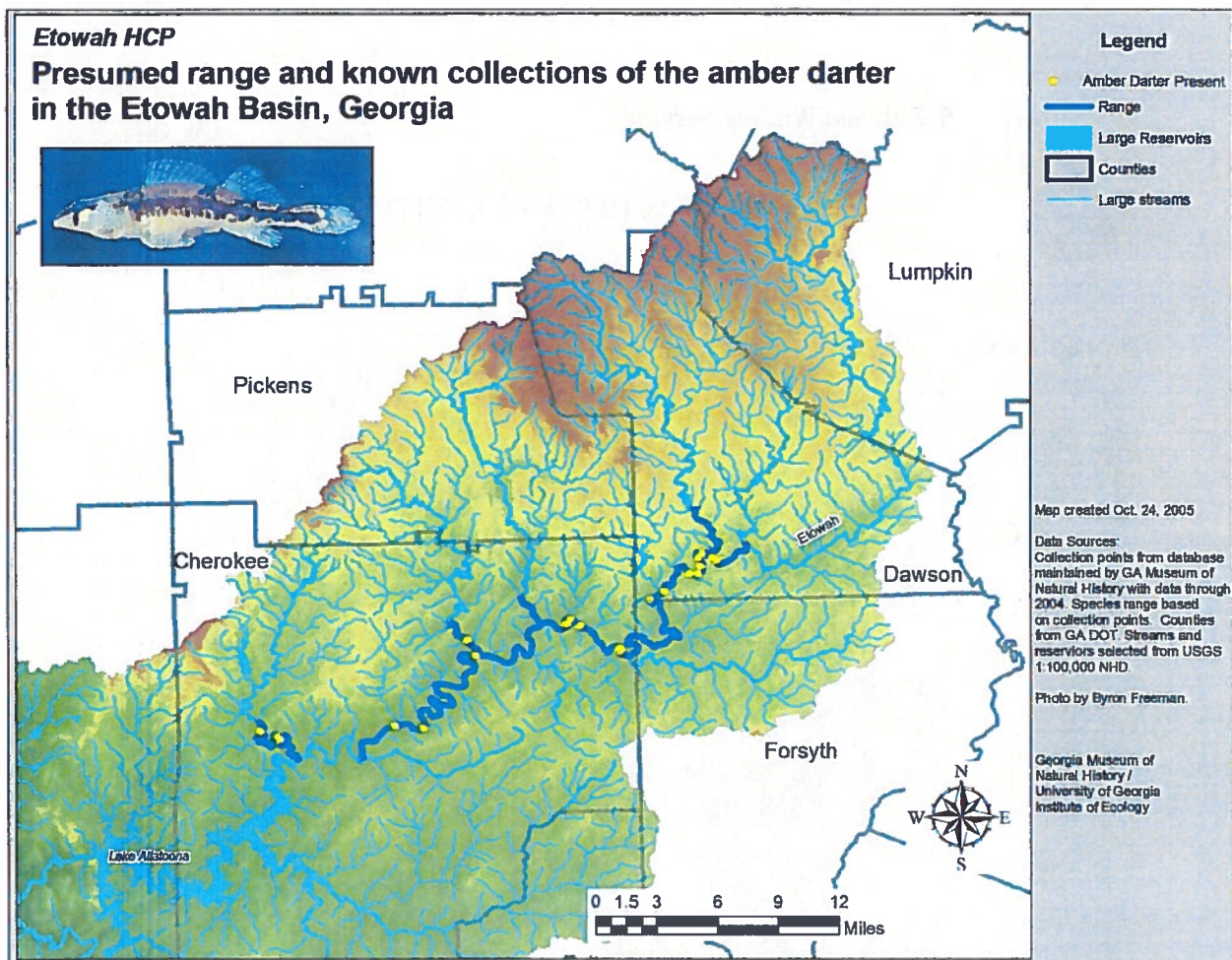
Bartow, GA | Cherokee, GA | Cobb, GA | Forsyth, GA | Pickens, GA

### *Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):*

MULTIPOLYGON (((-84.7440292 34.0955563, -84.7797348 34.2930889, -84.7302963 34.308631, -84.7028305 34.2880966, -84.5957138 34.3384593, -84.6039536 34.3611353, -84.5847275 34.3566006, -84.5709946 34.3771182, -84.2606308 34.3771182, -84.2551376 34.2319135, -84.2798569 34.2228299, -84.2716171 34.1933013, -84.3347885 34.1978448, -84.3650009 34.177397, -84.3704941 34.1319397, -84.4364121 34.11375, -84.450145 34.086458, -84.450145 34.0568817, -84.5407822 33.9794796, -84.6121933 33.9703688, -84.6286728 33.9908667, -84.6643784 33.9521444, -84.71931 33.9430307, -84.7220566 33.9521444, -84.7330429 33.9544227, -84.7302963 34.0932818, -84.7440292 34.0955563)))

**Figure 5. Spatial Query for Listed Aquatic Species in the Vicinity of Lake Allatoona**  
Source: IPaC - Information, Planning, and Conservation System at: <http://ecos.fws.gov/ipac/>  
Accessed: March 7, 2013.



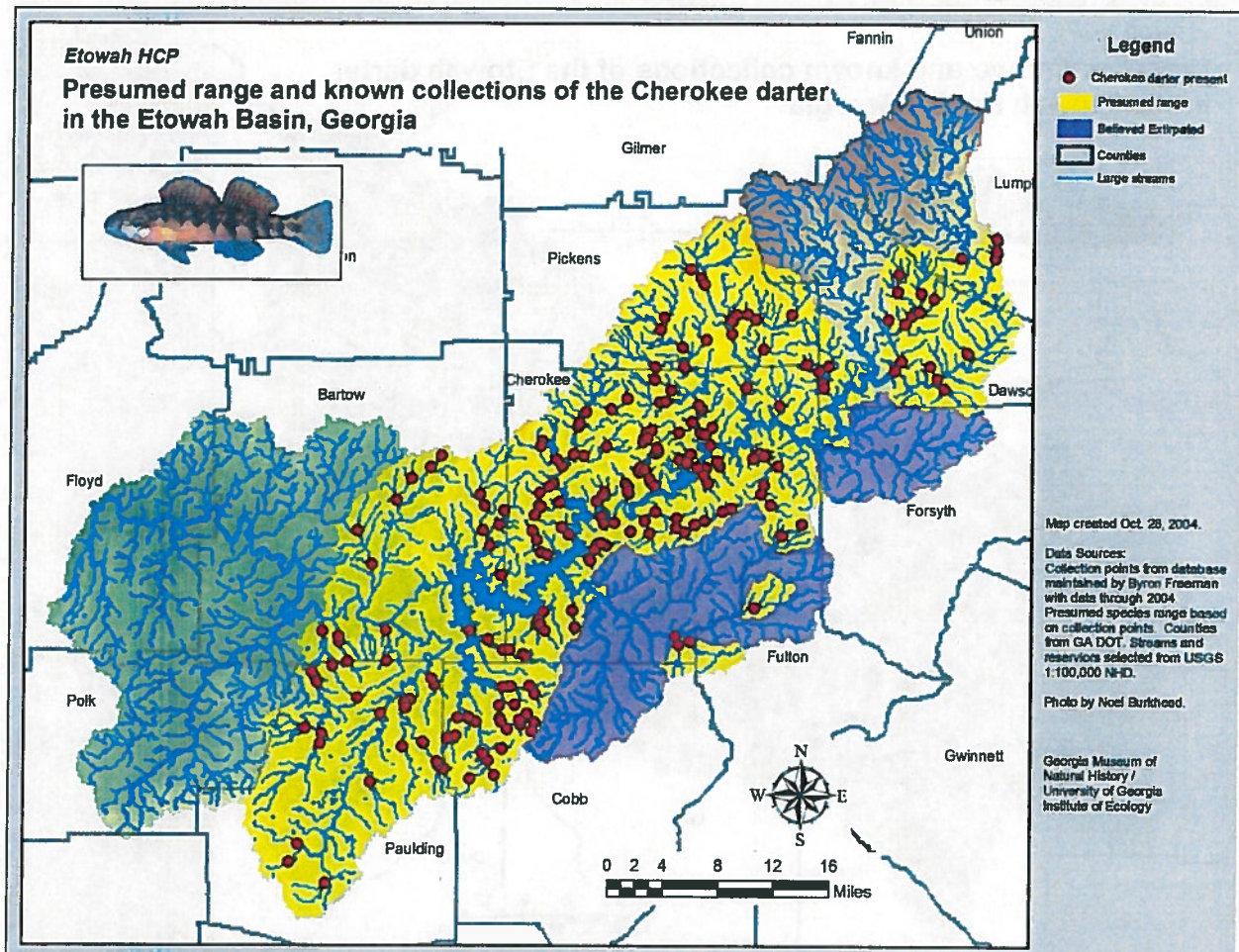


**Figure 6. Map of presumed range and known collections of the Amber Darter – analyzed in this biological evaluation relative to Lake Allatoona in the southeast section of the map.**

Source: Etowah Habitat Conservation Plan

[http://www.etowahhcp.org/background/images/range\\_antesella.jpg](http://www.etowahhcp.org/background/images/range_antesella.jpg)

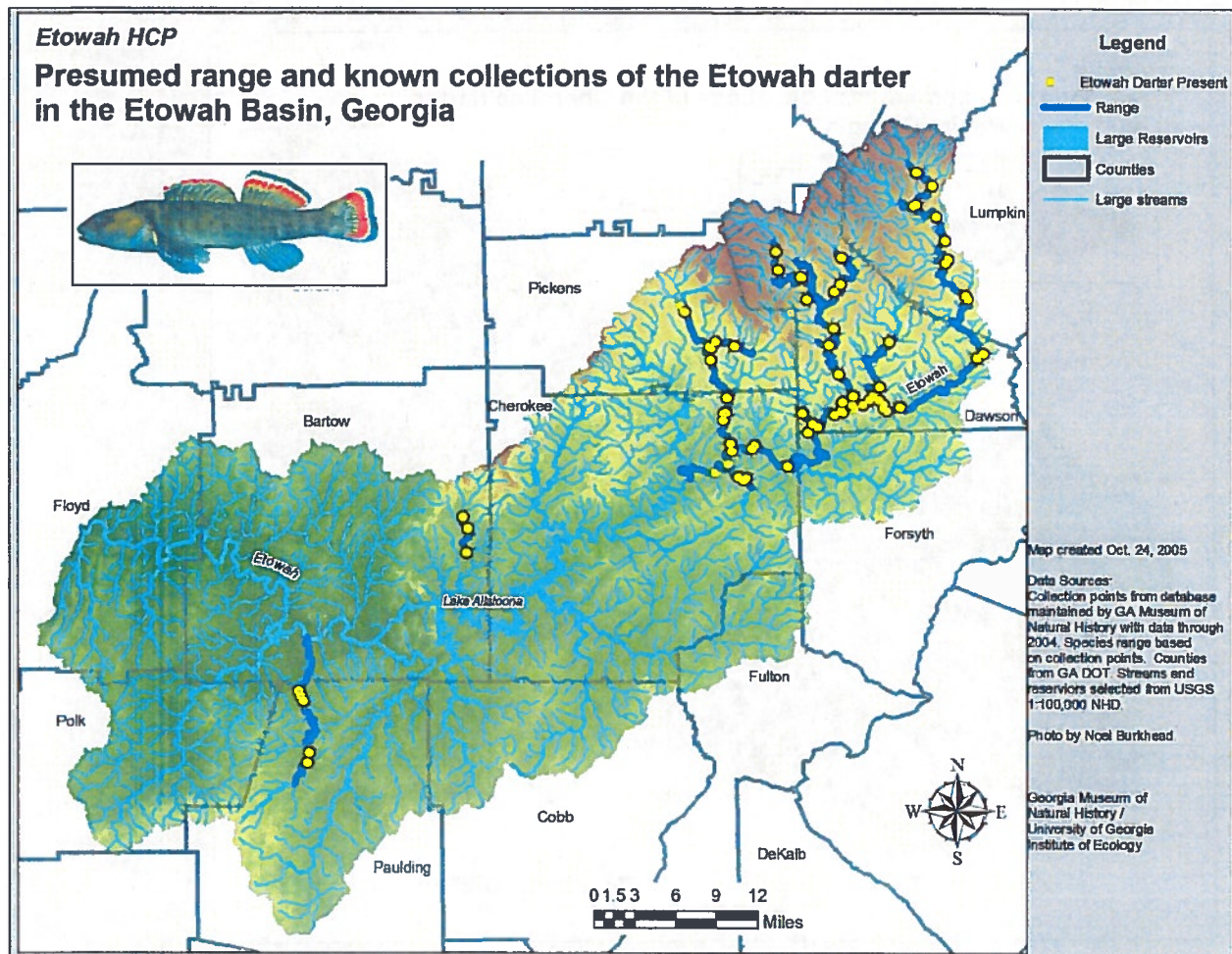




**Figure 7. Map of presumed range and known collections of the Cherokee Darter – analyzed in this biological evaluation relative to Lake Allatoona in the southeast section of the map.**

Source: Etowah Habitat Conservation Plan

[http://www.etowahhcp.org/background/images/range\\_scotti.jpg](http://www.etowahhcp.org/background/images/range_scotti.jpg)



**Figure 8. Map of presumed range and known collections of the Etowah Darter – analyzed in this biological evaluation relative to Lake Allatoona in the southeast section of the map.**

Source: Etowah Habitat Conservation Plan

[http://www.etowahhcp.org/background/images/range\\_etowahae.jpg](http://www.etowahhcp.org/background/images/range_etowahae.jpg)



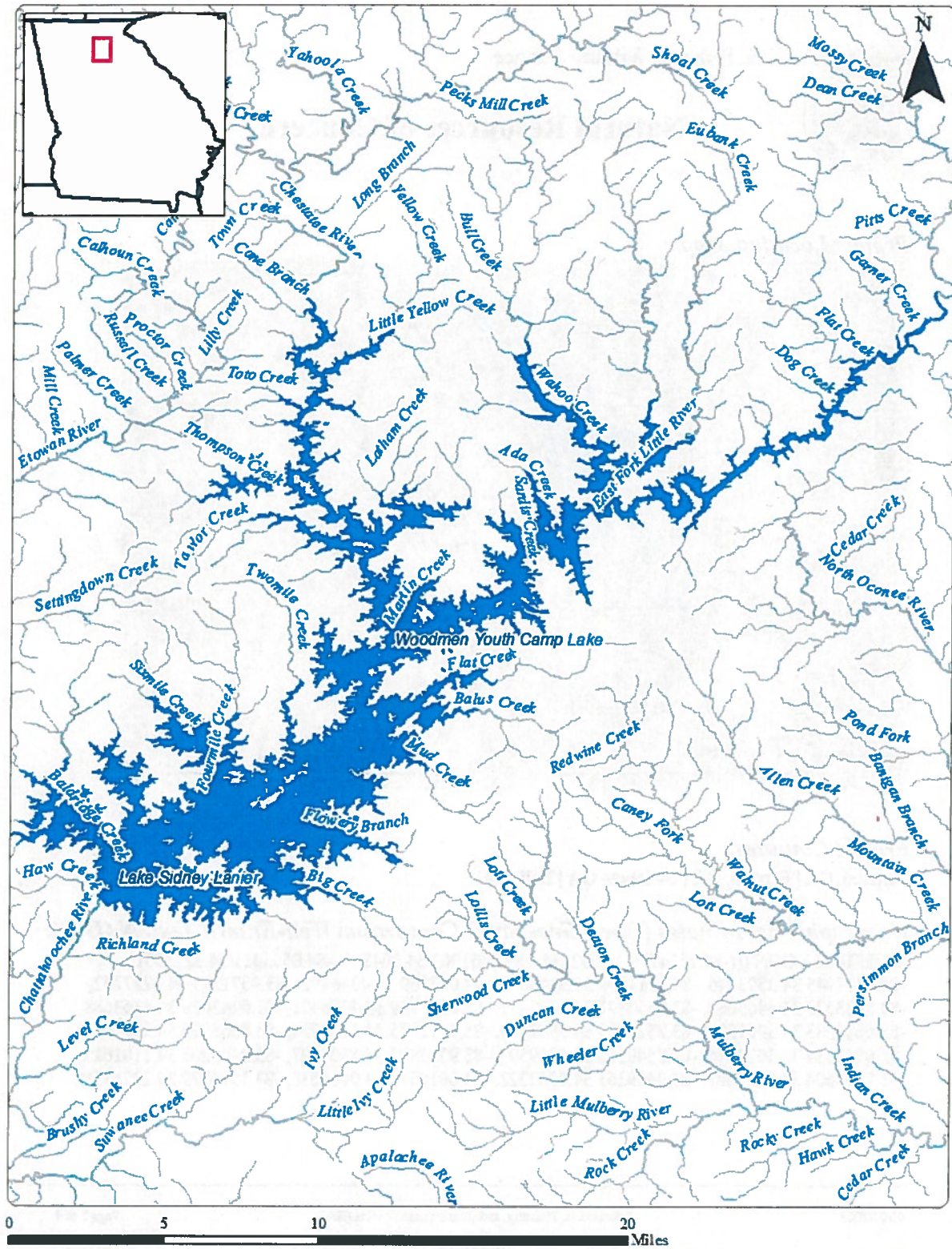


Figure 9. Map of Lake Sidney Lanier

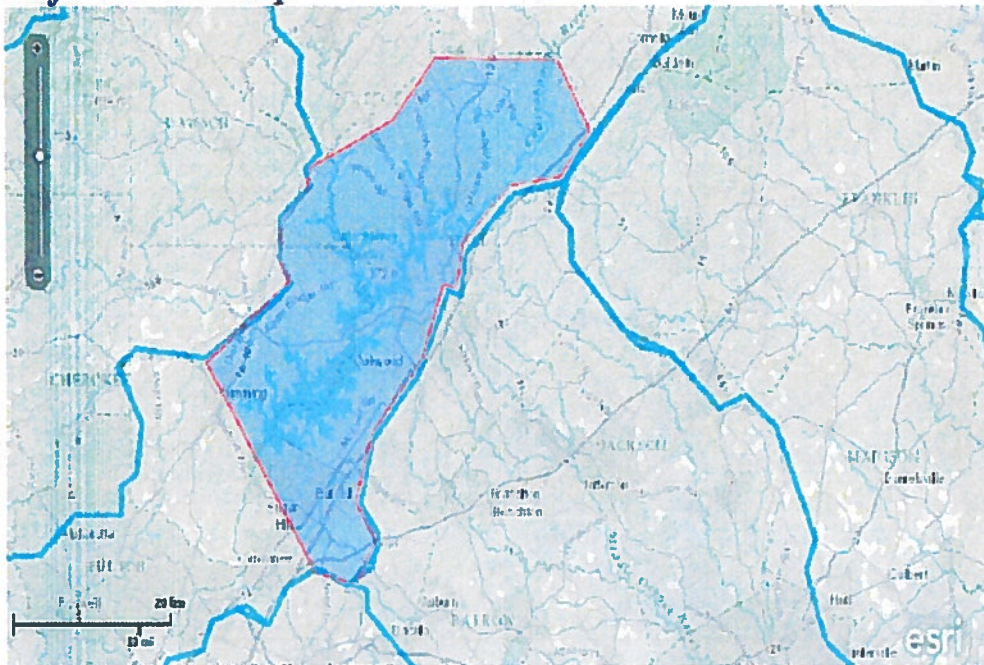




U.S. Fish and Wildlife Service

## Natural Resources of Concern

### *Project Location Map:*



### *Project Counties:*

Dawson, GA | Forsyth, GA | Gwinnett, GA | Hall, GA

### *Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):*

MULTIPOLYGON (((-84.1514779 34.232815, -84.0361902 34.304824, -84.0505411 34.3218951, -84.0477945 34.3593146, -84.0114709 34.3864616, -84.007969 34.4046492, -83.9571573 34.4227762, -83.8933679 34.4465052, -83.8356897 34.5008471, -83.6667749 34.4986401, -83.6242029 34.4363688, -83.6640283 34.3961508, -83.7326929 34.3882183, -83.7972375 34.3383958, -83.8068506 34.2975067, -83.8247034 34.3020446, -83.8549158 34.2339503, -83.9235803 34.1704027, -83.9469263 34.1101615, -83.9194604 34.0737687, -83.9469263 34.0362222, -84.0018579 34.0464638, -84.1514779 34.232815)))

**Figure 10. Spatial Query for Listed Aquatic Species in the Vicinity of Lake Lanier**  
Source: IPaC - Information, Planning, and Conservation System at: <http://ecos.fws.gov/ipac/>  
Accessed: March 7, 2013.



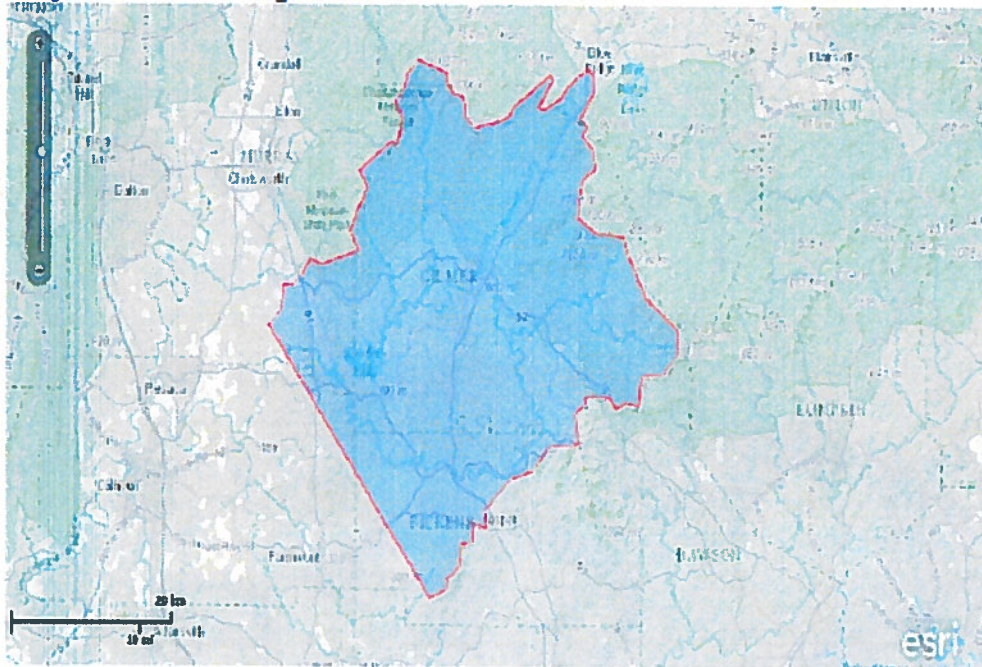




U.S. Fish and Wildlife Service

## Natural Resources of Concern

### *Project Location Map:*



### *Project Counties:*

Dawson, GA | Fannin, GA | Gilmer, GA | Gordon, GA | Murray, GA | Pickens, GA

**Figure 12. Spatial Query for Listed Aquatic Species in the Vicinity of Carters Lake**  
Source: IPaC - Information, Planning, and Conservation System at: <http://ecos.fws.gov/ipac/>  
Accessed: March 7, 2013.

## ATTACHMENT 3

### HABITAT & DISTRIBUTION OF LISTED AQUATIC SPECIES IN THE VICINITY OF RESERVOIRS UNDERGOING NUTRIENT CRITERIA REVISIONS

Table 3.1: Habitat and Distribution of Listed Aquatic Species in the Vicinity of Reservoirs Undergoing Nutrient Criteria Revisions. The table lists the species, their habitat, and their distribution in the vicinity of the reservoirs. The species are listed in the first column, their habitat in the second column, and their distribution in the third column. The distribution is categorized as 'Common', 'Occasional', or 'Rare'.

Species	Habitat	Distribution
Bluegill	Shallow water, open areas	Common
Chain Pickerel	Shallow water, open areas	Common
Common Carp	Shallow water, open areas	Common
Crayfish	Shallow water, open areas	Common
Golden Shiner	Shallow water, open areas	Common
Rock Bass	Shallow water, open areas	Common
Striped Bass	Shallow water, open areas	Common
White Crayfish	Shallow water, open areas	Common
White Perch	Shallow water, open areas	Common
Yellow Perch	Shallow water, open areas	Common



**Table 1. Habitat & Distribution of Listed Aquatic Species in the Vicinity of Reservoirs Undergoing Nutrient Criteria Revisions**  
 Checkmark indicates presence in the vicinity of the reservoir. Source: IPaC - Information, Planning, and Conservation System, <http://ecos.fws.gov/ipac/> Accessed: March 7, 2013.

Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
<b>Mussel Species</b>					
<b>Alabama moccasinshell</b> <i>Medionidus acutissimus</i> Threatened				✓	"Typically occupies medium streams to large rivers with gravel substrates and swift flowing shoal areas... In Georgia, this species appears to be restricted to the Conasauga River and several of its tributaries." <sup>16</sup>
<b>Coosa moccasinshell</b> <i>Medionidus parvulus</i> Endangered				✓	"Typically occupies small streams to large rivers with sand, gravel, or cobble substrates and swift flowing shoal areas." <sup>17</sup> "The species is usually found in sand and gravel in highly oxygenated, clear streams with moderate to strong flow in streams and small rivers... It apparently is extant only in some headwaters in Georgia..." <sup>18</sup>
<b>Finlined pocketbook</b> <i>Lampsilis altilis</i> Threatened	✓	✓	✓	✓	"...it is scattered throughout a limited number of fast flowing creeks and small rivers within its historic range." <sup>19</sup> "In Georgia, this species is currently extant in the Tallapoosa and Conasauga Rivers as well as in several tributaries to the Coosa and Tallapoosa Rivers. A lone individual was collected from Euharlee Creek in the Etowah River Basin in Georgia during a 2002 survey but the status of this population is uncertain... Habitat information is lacking on this species. Historically, it was found in large rivers to small creek habitats... Van der Schalie (1938; 1981) indicates that it

<sup>16</sup> [http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/medionidus\\_acutissimus.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/medionidus_acutissimus.pdf)

<sup>17</sup> [http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/medionidus\\_parvulus.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/medionidus_parvulus.pdf)

<sup>18</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Medionidus+parvulus>

<sup>19</sup> [http://naturalhistory.uga.edu/~GMNH/gawildlife/index.php?page=speciespages/ai\\_species\\_page&key=latilis](http://naturalhistory.uga.edu/~GMNH/gawildlife/index.php?page=speciespages/ai_species_page&key=latilis)



Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
<b>Georgia pigtoe</b> <i>Pleurobema hanleyianum</i> Endangered					generally occupies creeks and smaller rivers. It has been found associated with swift flowing riffles and gravel-cobble substrates in the Conasauga River. Recently, it has been found in stable sand and in gravel in small streams above the Fall Line..." <sup>20</sup> "Until recently, the species was presumed extinct, before fresh dead shells were collected in the upper Conasauga River above Dalton, Georgia... and a single large specimen was found alive in the Conasauga River in Georgia... As a result, the Georgia Pigtoe is currently only known from a few isolated shoals in the Upper Conasauga River... This species inhabits stretches of a medium sized river with good current and a sand/gravel substrate... A substrate composed of coarse sand and gravel in stretches of rivers with good current provides the most suitable habitat..." <sup>21</sup>
<b>Gulf moccasinshell</b> <i>Medionidus penicillatus</i> Endangered	✓	✓		✓	"This species is endemic to the Apalachicola River basin of Alabama, Georgia and Florida. Historically known from the mainstem and tributaries of the Chipola, Chattahoochee, and Flint Rivers. Currently, this species appears to be rare or extirpated outside of the Chattahoochee and Flint River drainages of Georgia and has drastically declined within these drainages." <sup>22</sup> "It appears to be extirpated from historical localities in the Chattahoochee River main stem." <sup>23</sup> "Medium-sized creeks to large rivers with sand, muddy sand and gravel substrates and slow to moderate currents; occasional in backwater

<sup>20</sup> [http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/hamiota\\_altilis.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/hamiota_altilis.pdf)

<sup>21</sup> <http://www.iucnredlist.org/details/17685/0>

<sup>22</sup> [http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/medionidus\\_penicillatus.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/invertebrates/medionidus_penicillatus.pdf)

<sup>23</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Medionidus+penicillatus>

Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
<b>Oval pigtoe</b> <i>Pleurobema pyriforme</i> Endangered	✓				areas with no current." <sup>24</sup> "The oval pigtoe occurs in small to medium-sized creeks to small rivers where it inhabits silty sand to sand and gravel substrates, usually in slow to moderate current... Stream extirpations in the ACF Basin are thought to include the Chattahoochee River main stem..." <sup>25</sup>
<b>Purple bankclimber</b> <i>Elliptioideus sloatianus</i> Threatened	✓				"The purple bankclimber inhabits small to large river channels in slow to moderate current over sand or sand mixed with mud or gravel substrates... Agricultural sources of contaminants in the ACF and Suwannee basins include nutrient enrichment from poultry farms and livestock feedlots and pesticides and fertilizers from row crop agriculture..." <sup>26</sup>
<b>Shiny-rayed pocketbook</b> <i>Lampsilis subangulata</i> Endangered	✓				"This species is restricted to Apalachicola and Ochlockonee river systems in Georgia, Florida and Alabama. It was erroneously reported from the Choctawhatchee River system. Within these river systems it has apparently disappeared from Mosquito Creek (Williams and Butler, 1994), all but one site (relict specimens only) in the Chattahoochee River system in Alabama (including Mill, Little Uchee and Cowikee Creeks) and from much of the Chipola River system (Big, Cowarts, Spring and Rocky Creeks)... Several Flint River streams have also lost subpopulations including Patsiliga, Gum, Aycocks and Dry Creeks." <sup>27</sup>

<sup>24</sup> [http://fwcg.myfwc.com/docs/gulf\\_moccasinshell.pdf](http://fwcg.myfwc.com/docs/gulf_moccasinshell.pdf)

<sup>25</sup> [http://www.fws.gov/ecos/ajax/docs/life\\_histories/F02S.html](http://www.fws.gov/ecos/ajax/docs/life_histories/F02S.html)

<sup>26</sup> [http://www.fws.gov/ecos/ajax/docs/life\\_histories/F02E.html](http://www.fws.gov/ecos/ajax/docs/life_histories/F02E.html)

<sup>27</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Lampsilis+subangulata>

Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
<b>Southern clubshell</b> <i>Pleurobema decisum</i> Endangered		✓		✓	"It has recently been found in the Conasauga River, Whitfield and Murray Counties, Georgia in the upper Coosa River drainage... In the Coosa River basin in Georgia, it is known historically from the Coosa, Etowah, Oostanaula, Conasauga, and Coosawattee River drainages but has not been collected there recently... except in the Conasauga... Usually found in highly oxygenated streams with sand and gravel substrate in shoals of large rivers to small streams; may be found in sand and gravel in the center of the stream or in sand along the margins of the stream..." <sup>28</sup>
<b>Triangular Kidneyshell</b> <i>Ptychobranthus greenii</i> Endangered		✓		✓	"...this mussel is now limited to portions of the Black Warrior River drainage in Alabama and the Conasauga River in Georgia." <sup>29</sup> "This species appears most prevalent in sections of river three feet in depth and having a good current and a firm substrate as opposed to coarse gravel and sand... in shoals and runs of small rivers and large streams..." <sup>30</sup>
<b>Fish Species</b>					
<b>Amber darter</b> <i>Percina antesella</i> Endangered		✓			"Endemic to the upper Coosa River System in Georgia and southeastern Tennessee, the amber darter was first discovered in 1948 in Shoal Creek (Cherokee County, Georgia), a tributary to the Etowah River that now flows into Allatoona Reservoir. Subsequent collection efforts in the Etowah River system yielded only a single specimen until the early 1990s, when amber darters were discovered at eight localities in the mainstem Etowah River upstream of Allatoona

<sup>28</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Pleurobema+decisum>

<sup>29</sup> [http://naturalhistory.uga.edu/~GMNH/gawildlife/index.php?page=speciespages/ai\\_species\\_page&key=pgreenii](http://naturalhistory.uga.edu/~GMNH/gawildlife/index.php?page=speciespages/ai_species_page&key=pgreenii)

<sup>30</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Ptychobranthus+greenii>

Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
					Reservoir and in the lower portion of Sharp Mountain Creek (a tributary to the Etowah River in Cherokee County). In June 1993, the amber darter was rediscovered in the lower portion of Shoal Creek, upstream from the 1948 locality and just above the area influenced by the Allatoona Reservoir... Amber darters occur in riffles or shoals with cobble and gravel and moderate to swift currents, typically 30-70cm/sec. They are often found in shoals with the submerged aquatic macrophyte, riverweed ( <i>Podostemum ceratophyllum</i> ). Amber darters rarely occur in very shallow (<20cm) or low-velocity (<10 cm/sec) areas, or areas with accumulated silt..." <sup>31</sup> "The amber darter lives in riffles - shallow areas where water flows rapidly over stones and rubble - of larger streams draining into the Alabama River system. It is most often observed in cool, clear streams with water depths of about two feet and prefers stony areas with silt- free bottoms. The species cannot tolerate slack currents that have a debris or mud bottom." <sup>32</sup> "Range includes the Conasauga, Coosawattee and Etowah rivers (Coosa River system), northwestern Georgia... mainstem Etowah River upstream of Allatoona Reservoir ...the lower portion of Shoal Creek (above the area influenced by the Allatoona Reservoir... and the Coosawattee River, downstream of Carter's Lake Reservoir (single specimen collected in 2010..." <sup>33</sup>
<b>Blue shiner</b> <i>Cyprinella caerulea</i>				✓	"the species is now restricted to the Conasauga River and tributaries in Tennessee and Georgia, Coosawattee

<sup>31</sup> [http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/fishes/percina\\_antelsella.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/fishes/percina_antelsella.pdf)

<sup>32</sup> <http://warnell.forestry.uga.edu/service/library/index.php3?docID=85&docHistory%5B%5D=5&docHistory%5B%5D=202&docHistory%5B%5D=360>

<sup>33</sup> <http://www.iucnredlist.org/details/16585/0>



Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
Threatened					River and tributaries in Georgia, and Weogufka and Choccolocco creeks and lower Little River, tributaries of Coosa River in Alabama... Habitat includes cool, clear, small to medium-sized rivers over firm substrates (sand, gravel, or rubble) in pools, backwaters and areas of moderate current... <sup>34</sup>
<b>Cherokee darter</b> <i>Etheostoma scotti</i> Threatened		✓	✓	✓	<p>"The Cherokee darter is now known from approximately 20 small tributary systems of the Etowah River, but healthy populations are known from only a few sites. It is endemic to the Etowah River systems in north Georgia, where it is primarily restricted to stream draining the Piedmont physiographic province and to a lesser extent, the Blue Ridge physiographic province. Due to the construction of the Allatoona Dam, Cherokee darter populations are fragmented and isolated. The largest populations of Cherokee darter occur in the northern tributaries upstream of the Allatoona Reservoir. Downstream of the dam populations are restricted to two tributary systems, the Pumpkinvine and Raccoon creeks in Paulding County. Cherokee darters inhabit small to medium size warm-water creeks of moderate gradient, with predominately rocky bottoms. It is usually found in shallow water in sections of reduced current, typically in runs above and below riffles and at the ecotones of riffles and backwaters. The Cherokee darter is associated with large gravel, cobble and small boulder substrates, and is uncommonly or rarely found over bedrock, fine gravel, or sand. It is most abundant in stream sections with relatively clear water and clean substrates (little silt</p>

<sup>34</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Cyprinella+caerulea>

Species	West Point	Allatoona	Lanier	Carters	Habitat & Distribution
<b>Etowah darter</b> <i>Etheostoma etowahae</i> Endangered		✓	✓	✓	deposition). The Cherokee darter is intolerant of moderate of heavy siltation and impoundment.” <sup>35</sup> “Range includes the Etowah River system (above and below Altoona Reservoir, in northern Georgia; Etowah River mainstem and eight tributaries... Adults typically occur in riffles of streams with moderate to strong current over gravel or cobble substrate... Warm and cool, medium and large creeks or small rivers that have moderate or high gradient and rocky bottoms; in relatively shallow riffles, with large gravel, cobble and small boulder substrates; typically associated with the swiftest portions of shallow riffles, but occasionally adults are taken at the tails of riffles; most abundant in sites with clear water and relatively little silt in the riffles; shuns pools, intolerant of stream impoundment....” <sup>36</sup>
<b>Goldline darter</b> <i>Percina aurolineata</i> Threatened		✓		✓	“Formerly this species occurred in... [the] Coosawattee River system; it survives in fragmented populations in the Coosawattee River... Habitat includes fast rocky runs of small to medium rivers... main channels in areas of white-water rapids to three or more feet deep, and substrates of bedrock, boulders, rubble and gravel. Podostemum and Justicia characteristically are present.” <sup>37</sup> “...[surveys] detected goldline darters at 7 sites located in the Cartecay River, Ellijay River, Mountaintown Creek and the Coosawattee River upstream of Carters Lake.” <sup>38</sup>

<sup>35</sup> [http://www.fws.gov/ecos/ajax/docs/life\\_histories/E031.html](http://www.fws.gov/ecos/ajax/docs/life_histories/E031.html)

<sup>36</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Etheostoma+etowahae>

<sup>37</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Percina+aurolineata>

<sup>38</sup> [http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/fishes/percina\\_aurolineata.pdf](http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/fishes/percina_aurolineata.pdf)

**Table 2: Life History of Aquatic Dependent Species in the Vicinity of Reservoirs Undergoing Nutrient Criteria Revisions.**

Species	Habitat & Distribution
<b>Mammal Species</b>	
<b>Gray Bay</b> <i>Myotis grisescens</i> Endangered	"...forested areas along the banks of streams and lakes provide important protection for adults and young... Do not feed in areas along rivers or reservoirs where the forest has been cleared... Foraging is generally parallel to streams, over the water at heights of 2 to 3 m... Caire et al. (1989) stated that this bats is apparently adapted to forest foraging and rarely is collected in the open or over streams..." <sup>39</sup>
<b>Indiana Bat</b> <i>Myotis sodalists</i> Endangered	"In summer, habitat consists of wooded or semiwooded areas, often but not always along streams... Though maternity sites have been reported as occurring mainly in riparian and floodplain forests... recent studies indicate that upland habitats are used by maternity colonies much more extensively than previously reported. Garner and Gardner (1992) reported that 38 of 51 roost trees in Illinois occurred in uplands and 13 trees were in floodplains... Forages along river and lake shorelines, in the crowns of trees in floodplains... The foraging habitat for an Indiana colony included an airspace 2-30 m above a stream and a linear distance of 0.8 km..." <sup>40</sup>
<b>Bird Species</b>	
<b>Wood Stork</b> <i>Mycteria Americana</i> Threatened	"Chiefly freshwater situations: marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought... Nests mostly in upper parts of cypress trees, mangroves, or dead hardwoods over water or on islands along streams or adjacent to shallow lakes. Feeds in freshwater marshes, swamps, lagoons, ponds, flooded pastures and flooded ditches, depressions in marshes (especially during drought)... Eats mainly fishes (usually over 3.5 cm long), also miscellaneous other small animals, detected mainly by contact with touch-sensitive bill. Forages mainly in shallow water (about 15-50 cm deep) and flooded fields; attracted to areas with falling water level and hence concentrated food sources..." <sup>41</sup>

<sup>39</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Myotis+griseus>

<sup>40</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Myotis+sodalis>

<sup>41</sup> <http://explorer.natureserve.org/servlet/NatureServe?searchName=Mycteria+americana>

